I. Development of a Mobile App for Communicating Mercury-Based Tribal Fish Consumption Advisories

Project Purpose Statement: Continuation of the Anishinaabe (Ojibwe/Chippewa) bimaadiziwin, or Indian lifeway, is closely linked to environmental health. An essential part of this lifeway is the harvesting of fish from local waters. Walleye (*Sander vitreus*), is a primary component of subsistence fishing efforts. Efforts are ongoing to reduce tribal members' exposure to mercury, an environmental contaminant that can reach levels of concern in this top piscivore. Tribal members are disproportionately affected by the presence of mercury in fish because their consumption rate is much greater than that of the general U.S. population.

The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) has produced walleye consumption advisories since 1996 for its member tribes for inland lakes in the 1837 and 1842 ceded territories of Wisconsin, Minnesota, and Michigan. Culturally sensitive consumption advice is communicated via lake-specific, GIS based, color-coded mercury maps [Madsen *et al*., 2008]. The maps combine text and graphics to encourage continued walleye harvest and consumption while limiting mercury intake. Color codes correspond with the number of meals of walleye that can be consumed from a given lake for the sensitive (women of childbearing age and children under 15 years of age) and general populations without posing an unacceptable health risk. The maps have been demonstrated to promote exposure-reducing behaviors without adversely affecting harvest (Deweese *et al*., 2009; Foran *et al*., 2010).

The goal of this project is to increase access to GLIFWC's advisory maps, which are established as a well-accepted, effective outreach tool. The maps are currently available online and are distributed at tribal spearing permit registration stations, annual spearers meetings, and numerous community events. But, there can be difficulty accessing and using lake advisories when in the field due to lack of Wi-Fi and/or cellular networks in rural areas. Mobile touch-screen devices may provide a unique opportunity to overcome this barrier through the development of a mobile application, or "app", which allows instant, off-line access to the consumption advice provided on the mercury maps. In addition, the development of a mobile app will provide the opportunity to reach additional community members, especially younger tribal members, increasing the public health impact of the advisories.

GLIFWC proposes to partner with the Medical College of Wisconsin (MCW) and University of Wisconsin – Milwaukee (UWM) Mobile Innovation Lab to develop mobile app software that provides an on-demand, dynamic output of walleye advisory maps. We will test the potential to adopt this technology during the spring 2016 spear fishing season, by providing demonstrations at tribal spearers meetings and surveying fishers about the app's functionality and usability and the likelihood that they would download the app for use on a mobile device.

Key outputs from this project include: 1) development of a mobile app to communicate walleye consumption to tribal members, 2) demonstrations of the mobile app at a minimum of two tribal spearers' meetings, 3) collection of at least 30 surveys of tribal spearers on their reactions to the mobile app and their likelihood to utilize this technology, and 4) training of GLIFWC staff on launching, hosting, updating, and maintaining the mobile app. The outcomes of this project will include: 1) Launch of one new public health outreach program in the form of a mobile app communicating walleye consumption advice to tribal members, and 2) reduction of exposure to

mercury by tribal members through fish consumption (exact number will be gauged by number of mobile app downloads with a target of >100 downloads following launch).

This project includes activities related to three federal environmental statutes: Clean Water Act [Section 104(b) (3)], Clean Air Act [Section 103(b) (3)], and Toxic Substances Control Act [Section 10(a)].

II. Environmental and Public Health Information about the Affected Community

Tribal members harvest and consume freshwater fish as a part of their bimaadiziwin, or traditional lifeway, which incorporates culture, spirituality, language, and traditions, including the consumption of traditional foods. Courts have reaffirmed the tribes' rights to hunt, fish, and gather on public lands throughout the ceded territory.

In Wisconsin, approximately 500 members of GLIFWC's member tribes participate in spring spearing and netting each year, harvesting approximately 30,000 fish from over 200 inland lakes. Another 2,500 fish are typically taken by tribal members from inland lakes of the western Upper Peninsula of Michigan (harvest data in the eastern Upper Peninsula unavailable). Tribal harvesters from Minnesota and Wisconsin also typically harvest over 50,000 fish annually from Mille Lacs in Minnesota. The vast majority (>95%) of fish harvested each spring are walleye.

Mercury, in the form of methylmercury, is an environmental contaminant found in subsistence fish species of GLIFWC's eleven member tribes. Mercury is a known neurotoxicant, which can cause health impacts that are especially severe to the developing nervous systems of fetuses and young children. Elevated mercury levels are ubiquitous, as demonstrated by widespread mercury-based fish consumption advisories. The largest source of mercury emissions in the U.S. is fossil fuel fired power plants (e.g., coal), but within the Lake Superior basin the primary source is the mining and metals processing industry. Mercury can move throughout the environment and enter aquatic food webs. Once present in a food web, mercury bioaccumulates, meaning it increases in concentration with each successive trophic level. As a result, top predator fish, such as walleye, have mercury levels that pose a public health risk to tribal members who consume them. Tribal members are disproportionately affected by this public health risk because they consume fish at a much higher rate than the general U.S. population.

The proposed project seeks to address the issue of mercury exposure by tribal members through subsistence fish (walleye) consumption. GLIFWC's existing health and culture based advisory program has positively impacted the health of tribal members by influencing walleye harvest and consumption patterns in ways that reduce mercury exposure (DeWeese *et al.*, 2009; Foran *et al.*, 2010). The proposed project would expand GLIFWC's successful mercury outreach program so that it can realize an even greater positive public health impact. The development of a mobile app will make safe fish consumption information more easily accessible and will assist in communicating this important public health information to a larger percentage of the tribal community. The anticipated results will include 1) tribal public better informed about the risks of mercury exposure through fish consumption, 2) tribal members empowered to make informed decisions regarding the health of their family and themselves, 3) improved public health as a result of decreased mercury exposure in a population disproportionately affected by its presence in fish, 4) tribal members ability to exercise treaty rights strengthened through information on where to access high quality natural resources (i.e., lakes with lower fish mercury levels), and 5) potential secondary health benefits (e.g., decreased rates of obesity, diabetes, and cardiovascular

disease; increased physical fitness) as a result of improved nutrition through traditional food consumption and increased physical activity related through subsistence food gathering practices.

Current enrolled tribal membership is over 40,000 among GLIFWC's 11 member tribes. These tribes have reservations located in the 1836, 1837, 1842, and 1854 treaty ceded territories of northern Wisconsin, northern Michigan, and northeast Minnesota. Because a significant portion of this population is engaged in subsistence fishing activities, this project has the potential to positively impact the public health of a significant portion of the population that is at increased risk of mercury exposure due to high rates of fish consumption.

III. <u>Organization's Historical Connection to the Affected Community</u>

GLIFWC was established 30 years ago as an intertribal natural resource agency comprised of 11 federally recognized Ojibwe tribes. The organization's purpose is to protect and enhance treaty-guaranteed rights to hunt, fish, and gather on territories ceded by the Chippewa in the Treaties of 1836, 1837, 1842, and 1854, and to provide cooperative protection and management of natural resources. Part of GLIFWC's mission is "to protect ecosystems in recognition that fish, wildlife, and wild plants cannot long survive in abundance in an environment that has been degraded." It is within this context that in 1989 GLIFWC began collecting and testing fish for mercury from inland lakes within the ceded territories. In 1996, GLIFWC began issuing fish consumption advisories for its member tribes, focusing on walleye, the most commonly harvested subsistence fish resource. The advice, which is communicated via lake-specific, GIS based, color-coded mercury maps, addresses a critical environmental public health issue.

GLIFWC's mercury program was most recently supported by a 4-year Great Lakes Restoration Initiative (GLRI) grant (EPA #GL00E00613-0, $458,524) that allowed for mercury testing of approximately 500 fish each year. In addition, this grant supported an expansion of GLIFWC's mercury outreach program, which included developing additional outreach materials and providing information on mercury and fish at over 100 tribal events. The proposed development of a mobile app builds off of GLIFWC's 25 years of mercury testing and tribal outreach.

The affected community is integral to all aspects of the decision making process for GLIFWC projects. GLIFWC's mission, policies, and scope of work are directly guided by the community through its Board of Commissioners, Voigt Intertribal Task Force, and Great Lakes Indian Fisheries Committee. Each group is comprised of representatives from GLIFWC's member tribes. In addition, GLIFWC has formed a Tribal Elders Network of over 300 elders representing all 11 member tribes. The Network was founded over a decade ago and has been integral to several projects as well as the language and culture programs. They bring extensive traditional ecological knowledge and cultural experience to many GLIFWC projects. GLIFWC also frequently solicits direct feedback from the community throughout project development and implementation. For example, during the development of the mercury maps, a number of community focus groups were convened to provide feedback on draft maps in order to improve their clarity, utility, usability, and cultural relevance.

The proposed project is in direct line with GLIFWC's Strategic Plan, including the strategies to "*provide culturally appropriate information about contaminant levels and risks associated with treaty resources and their use, and work with health care professionals and programs to inform and advise members*," and to "*promote sustainable, diverse ecosystems to meet the spiritual,*

cultural, medicinal, subsistence, and economic needs of tribal members by assessing and managing impacts of habitat loss and degradation, invasive species, contaminants, and disease." The development of a mobile app would also contribute to GLIFWC's Education & Outreach and Agency Operations Strategies to "*develop, update, and disseminate informational materials on GLIFWC's mission, programs, and accomplishments that incorporate an Anishinaabe perspective in a variety of formats and venues (e.g. printed materials, websites, interactive media, conferences, informational booths)*" and to "*use technology to improve the efficiency of communications with member tribes.*"

IV. Project Description

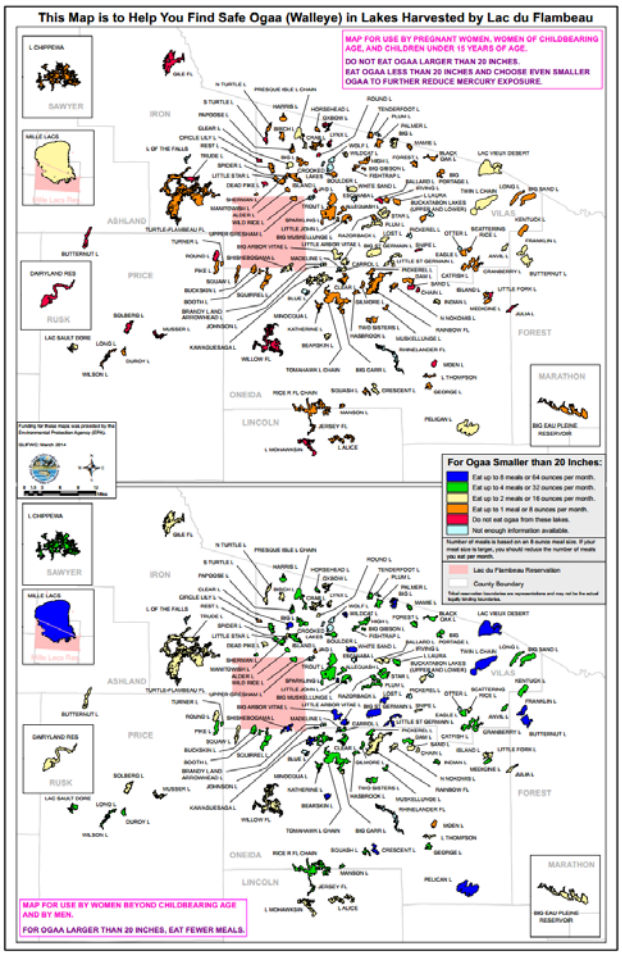
The proposed one-year project is for the development of a mobile app to communicate safe walleye consumption information to GLIFWC's eleven member tribes. The anticipated overarching project results will include 1) expanded reach of established, successful outreach tool to inform the tribal about the risks of mercury exposure through fish consumption, 2) tribal members of various ages empowered to make informed decisions regarding the health of their family and themselves, 3) improved public health as a result of decreased mercury exposure in a population disproportionately affected by its presence in fish, 4) reduced barriers to tribal members exercising treaty rights through information on where to access high quality natural resources, and 5) promotion of established behavioral health factors (e.g., diet, physical activity, and cultural well-being related to traditional food harvest and consumption). The methods for achieving these results as well as the specific outputs and outcomes for the project are described below and in the grant application document *Project Performance Measures*.

Methods:

Collection and mercury testing of fish, the creation of mercury maps to communicate safe walleye consumption advice, and tribal mercury outreach activities were most recently supported under a 4-year Great Lakes Restoration Initiative (GLRI) grant (EPA #GL00E00613-0, 2010-2014, $458,524). The testing and generation of the maps were conducted according to an EPA-approved Quality Assurance Project Plan (QAPP). GLIFWC maintains a large fish mercury Excel database that is used to generate the mercury maps. GLIFWC has dedicated staff for updating and maintaining the database and in-house GIS expertise. In addition to the mercury testing conducted by GLIFWC, the database includes data collected by the Wisconsin Department of Natural Resources, Minnesota Department of Health, and Michigan Department of Environmental Quality. GLIFWC exchanges data with each of these agencies annually according to Memoranda of Understanding (MOUs) or other cooperative agreements.

To date, the mercury maps have been available in pdf format only. Hard copies are distributed at tribal spearing permit registration stations, annual spearers meetings, and numerous community events, such as powwows and tribal health fairs. This project would expand GLIFWC's mercury outreach program by making a queryable version of the maps available through a mobile app platform for smartphones and tablets. The goal is to increase access by tribal members to GLIFWC's advisory maps in an effort to reduce mercury exposure from fish consumption.

There can be difficulty accessing and using lake advisories when in the field due to lack of Wi-Fi and/or cellular networks in rural areas. Additionally, saving, accessing, and reading pdfs on small portable devices can be cumbersome. Mobile touch-screen devices provide a unique opportunity to overcome this barrier through the development of a mobile application, or "app,"



Example of a GLIFWC mercury map designed to communicate safe walleye consumption advice to both sensitive and general tribal populations.

which allows instant, off-line access to the lake-specific consumption advice normally provided on the mercury maps. In addition, the development of a mobile app will provide the opportunity to reach additional community members, especially younger tribal members, increasing the public health impact of the advisories.

Preliminary data from member tribes of the nearby Inter-Tribal Council of Michigan suggest that as much as half of the Anishinaabe population they serve owns and uses smart phones. An unknown additional portion of the population may either be willing to, or already does, use non-cellular mobile devices such as tablets.

GLIFWC proposes to partner with the Medical College of Wisconsin (MCW) and the University of Wisconsin – Milwaukee (UWM) Mobile Innovation Lab (a.k.a. the Mobile App Brewery) to develop mobile app software that provides an on-demand output of walleye advisory maps. We will then test the potential to adopt this technology during the spring 2016 spear fishing season, by providing demonstrations at tribal spearers meetings and surveying fishers about the app's functionality and usability and the likelihood that they would download the app for use on a mobile device. Following feedback from the community, the mobile app will be launched and made available for download by the public for use on smartphones and tablets.

Key features of the software will be: 1) ability to query consumption advisories by lake name and county, color-coded advisory scheme, or through an interactive map, 2) general and sensitive population consumption guidelines, and 3) off-line "in the field" access to information. The app will be designed to convey the same information provided by the GLIFWC maps in a mobile-friendly format. The central structure of the proposed app is a basic querying system that will rely on metadata provided by GLIFWC. The requisite metadata (lake shape files, advisory recommendations, lake names, locations) are already maintained by GLIFWC as previously described. These existing databases provide a unique opportunity to quickly and efficiently convert the information to a mobile format.

The features outlined above will follow recommendations from community feedback regarding the mercury advisory maps. For example, the color-coding scheme was developed as part of those recommendations. If successfully received by the community, the ongoing monitoring and

outreach program will adopt the software and host it on their website. Using PHP, the app contractors will work with GLIFWC staff to build a web interface that will manage the images and metadata. PHP is a popular, general-purpose scripting language that is especially suited to the web and is free to use. The software database will be updated regularly by GLIFWC biological and IT staff as ongoing monitoring continues. The number of mobile app downloads will be tracked to monitor project efficacy beyond the one-year grant period.

Key outputs from this project include: 1) development of the mobile app, 2) demonstrations of the mobile app at ≥2 tribal spearers' meetings, 3) collection of ≥30 surveys of tribal spearers on their reactions to the mobile app and their likelihood to utilize this technology, and 4) training of GLIFWC staff on launching, hosting, updating, and maintaining the app. The outcomes of this project will include: 1) Launch of one new public health outreach program in the form of a mobile app communicating walleye consumption advice to tribal members, and 2) reduction of mercury exposure by tribal members through fish consumption (to be gauged by number of mobile app downloads with a target of >100 downloads following launch). The specific activities related to these outputs and outcomes are detailed in the Milestone Chart on the next page.

Environmental Statutes: This project includes activities related to:

- Clean Water Act [Section 104(b) (3)]: This project seeks to mitigate the public health effects of water pollution, specifically mercury pollution.
- Clean Air Act [Section 103(b) (3)]: This project seeks to mitigate the public health effects of air pollution, specifically mercury pollution.
- Toxic Substances Control Act [Section 10(a)]: This project will provide public education on a toxic substance, specifically mercury.

Partners: GLIFWC will partner with the Medical College of Wisconsin (MCW). MCW provides an outstanding environment that strongly supports basic, clinical, and translational research. MCW is a private, national, freestanding institution offering the degrees of MD, PhD, MS, MPH and MA, along with residency training in almost all medical specialties and subspecialties. There are more than 1,265 students enrolled in educational programs at MCW. Approximately 200 scientists are engaged in postdoctoral research fellowship training through the Office of Postdoctoral Education. MCW is the largest national research institution in the Milwaukee metro area and the second largest in Wisconsin. Dr. Dellinger's (co-investigator) academic department is MCW's Institute for Health and Society, Division of Epidemiology. As one of MCW's centers and institutes focused on strengthening community and individual capacity to improve health, the mission of the Institute for Health and Society is to improve health and advance health equity through community and academic partnerships. The Institute seeks to integrate public and community health across research, education, clinical, and community initiatives.

MCW brings a strong public health component to the project to complement GLIFWC's natural resource expertise. Dr. Dellinger's experience with working with Native American tribes will further enhance the partnership, ensuring the mobile app is developed to communicate information in a culturally appropriate manner. Dr. Dellinger will coordinate with the University of Wisconsin – Milwaukee's Mobile App Innovation Lab on the production of the touch-enabled mobile application software to communicate tribal walleye consumption advice and will consult on the design of the mobile app. Drs. Moses and Dellinger will share the responsibilities of demonstrating the mobile app to tribal spearers, summarizing and reviewing spearers' reactions to the mobile app as indicated by informal surveys, and preparing reports to the EPA.

Activity/Milestone	Assigned to Position	Target Dates	Output/Outcome
Establish subcontract with partner, MCW.	Environmental Biologist (PM)	June 2015	Contract signed. Procurement procedures followed.
Establish subcontract with contractor, UWM.	Environmental Biologist (PM)	June 2015	Contract signed. Procurement procedures followed.
Prepare and finalize the Quality Assurance Project Plan (QAPP).	Environmental Biologist (PM) Research Specialist (CI)	June - July 2015	QAPP written and approved by EPA.
GLIFWC provides data (consumption advice, GIS shape files, etc.) to UWM.	Environmental Biologist (PM)	July 2015	Data successfully transferred.
Consultation among GLIFWC, MCW, and UWM on design and function of mobile app.	Environmental Biologist (PM) Research Specialist (CI) UWM Mobile Innovation Lab	July 2015	Mobile app design features and functionality determined.
Mobile App software developed.	UWM Mobile Innovation Lab	Aug – Dec 2015	Mobile app delivered to GLIFWC/MCW.
Travel to Washington D.C. for EJSG Training Workshop.	Environmental Biologist (PM)	Fall 2015	Staff trained in EJSG program strategic planning and grant management.
Prepare and submit semiannual report to the EPA.	Environmental Biologist (PM) Research Specialist (CI)	December 2015	Report prepared, submitted and accepted by EPA.
Field testing of mobile app.	Environmental Biologist (PM) Research Specialist (CI)	January 2016	App tested and feedback provided to UWM.
Mobile app revisions.	UWM Mobile Innovation Lab	February 2016	Revised mobile app delivered to GLIFWC/MCW.
Prepare mobile app demonstration and tribal spearer survey.	Environmental Biologist (PM) Research Specialist (CI)	March 2016	Demonstration and survey created.
Conduct mobile app demonstrations at tribal spear fisher meetings.	Environmental Biologist (PM) Research Specialist (CI)	April 2016	Demonstrations performed at ≥2 tribal spearers meetings.
Conduct survey of spear fishers who attended demonstration.	Environmental Biologist (PM) Research Specialist (CI)	April 2016	Surveys collected at ≥2 tribal spearers meetings from ≥30 tribal members.
Compile data from surveys.	Environmental Biologist (PM) Research Specialist (CI)	April 2016	Summary of survey results prepared outlining reaction of tribal members to mobile app. Feedback provided to UWM.
Final revisions to the mobile app.	UWM Mobile Innovation Lab	May 2016	Revised mobile app delivered to GLIFWC/MCW.
Training of GLIFWC staff by UWM on hosting, maintaining, and updating the mobile app	Environmental Biologist (PM) UWM Mobile Innovation Lab	May 2016	GLIFWC biological and IT staff trained. Training video produced by UWM.
Public launch of mobile app.	UWM Mobile Innovation Lab	May 2016	Mobile app available for download to tribal members with a smartphone or tablet. Number of downloads tracked.
Outreach to tribes regarding availability of the mobile app: publish one Mazina'igan article (GLIFWC triannual newspaper) and at least one Facebook post	Environmental Biologist (PM)	May 2016	Community education/outreach regarding the project reaching a distribution of over 18,000 in the affected community.
Provide project update and mobile app demo to GLIFWC's Voigt Intertribal Task Force and/or Board of Commissioners.	Environmental Biologist (PM)	June 2016 (after project end)	Outreach/education to ~25 tribal leaders/representatives of the affected community, with information brought back to additional tribal members and councils in the Task Force members' home tribes.
Prepare and submit final project report to the EPA.	Environmental Biologist (PM) and Research Specialist (CI)	June 2016 (after project end)	Report prepared, submitted and accepted by EPA.

V. Organizational Capacity and Programmatic Capability

GLIFWC has established accounting, property management, record keeping, and personnel policies to ensure compliance with OMB Circular A-133 requirements, which have been funded since 1990 through a fixed carry-forward indirect cost rate approved by the DOI's National Business Center. GLIFWC's FY2014 approved IDC rate is 16.98%.

GLIFWC has received a large number of federal grants within the last five years. For example, in FY2013 GLIFWC spent $7,417,472 contracted from 13 different federal programs. GLIFWC's FY2013 Single Audit determined the organization to be a "low-risk auditee" and reported 1) no significant deficiencies relating to the audit of the financial statements, 2) no instances of noncompliance, 3) no findings, and 4) no questioned costs.

GLIFWC will utilize its existing accounting, property management, record keeping, and personnel policies and the experience and expertise of key staff to effectively manage and complete this project.

The qualifications of critical staff assigned to the project are provided in the attached curriculum vitae. The experience of the Project Manager and Co-investigator are well suited to the successful management and completion of this project.

- Dr. Sara Moses, Environmental Biologist/Project Manager, Great Lakes Indian Fish & Wildlife Commission. Dr. Moses will provide overall direction for the project, supervise project staff, prepare the QAPP, collect and provide all mercury and fish consumption data required to develop the mobile app, and ensure proper project reporting and oversight.
- Dr. Matthew Dellinger, Research Specialist/Co-investigator, Institute for Health and Society, Medical College of Wisconsin. Dr. Dellinger will coordinate with the University of Wisconsin – Milwaukee's Mobile App Innovation Lab on the production of the touch-enabled mobile application to communicate tribal walleye consumption advice and consult on the design of the mobile app.
- Drs. Moses and Dellinger will share the responsibilities of demonstrating the mobile app to tribal spearers, summarizing and reviewing spearers' reactions to the mobile app as indicated by informal surveys, and preparing progress reports to the EPA.

GLIFWC has received a number of federal grants, including EPA grants, in the last five years. All grants have met their reporting requirements, including progress reports and reports of financial status. Of particular note, is GLIFWC's 4-year Great Lakes Restoration Initiative (GLRI) grant (EPA #GL00E00613-0, 2010-2014, $458,524, Project Officer: Tina Davis), which was successfully closed as of October 31, 2014. Dr. Moses served as Project Manager on this grant. Five federal grants received by GLIFWC from the last five years have been selected for detail and are included in Section VII (Past Performance in Reporting on Outputs and Outcomes).

VI. Qualifications of the Project Manager (PM)

The Project Manager (PM), Dr. Sara Moses, has a PhD in toxicology from the University of Alaska Fairbanks. Her research has focused on the impacts of contaminants on Alaska Native and Native American communities. She has two published manuscripts related to the risks and benefits of subsistence foods (nutrients vs. contaminants) and has co-authored several other papers on metals and other environmental contaminants, particularly mercury, in fish and

wildlife of Alaska and the Great Lakes region. She has extensive experience with study design, sampling and analysis of metals and organic contaminants in biota, development of fish consumption advisories, linking environmental and human health, and communicating risk/benefit information to tribal communities.

Moses has served as the Environmental Biologist for GLIFWC for over two years, focusing on contaminant issues and their relationship to tribal health. GLIFWC is an intertribal natural resource agency comprised of 11 federally recognized tribal governments. Therefore, the PM works on a daily basis with the community served by this project and has developed strong ties to GLIFWC's member tribes. The PM is regularly contacted by GLIFWC's member tribes for input on issues relating to environmental contaminants and human health.

Moses oversaw and coordinated all aspects of GLIFWC's GLRI competitive grant (GL00E00613, $458,524), *Mercury Testing and Updating of Tribal Walleye Consumption Advice*, which was successfully closed on 10/31/2014. This project had several aspects promoting direct coordination and communication with GLIFWC's member tribes. Tribal fishermen (commercial and subsistence) worked with Moses to assist in the collection of fish for mercury analysis. The project also included a significant outreach component. Moses and the Outreach Coordinator developed and disseminated materials (mercury maps, informational brochures and cards, educational display boards) to the tribal community at over 100 events. The GLRI Mercury grant relied on community involvement, required effective education and outreach to the affected communities, and demanded a multifaceted understanding of the tribal perspective to appropriately balance the cultural importance of natural resources with the potential risks of contaminants.

In addition, the PM serves GLIFWC's member tribes as a representative on the Lake Superior Binational Program Chemical Committee, Great Lakes Water Quality Agreement Annex 3 (Chemicals of Mutual Concern) Subcommittee, Bemidji Area Tribal Environmental Public Health Advisory Committee, and National Fish Consumption Advisory Awareness and Effectiveness Guidance Document Workgroup and serves as a Consultant to Michigan Technological University's (MTU) National Science Foundation Grant, "Managing Impacts of Global Transport of Atmosphere-surface Exchangeable Pollutants (ASEPs) in the Context of Global Change." Moses also advises GLIFWC's member tribes on a variety of contaminant issues as they arise, including potential impacts of proposed mining permits, impacts of pesticide treatments (e.g., plant and zebra mussel control) to waters containing subsistence resources, and development of total maximum daily load (TMDL) criteria for mercury.

VII. Past Performance in Reporting on Outputs and Outcomes

GLIFWC has received a number of federal grants in the last five years. Five EPA grants have been selected for detail below. Each of these grants had specified reporting requirements for communicating progress towards expected outputs and outcomes back to the EPA. For each grant, these reporting requirements were met in full and on time.

EPA GLRI competitive project grant, Grant Number GL00613. Title of Project: Mercury Testing and Updating Tribal Walleye Consumption Advice. Project Period: 9/1/2010 – 10/31/2014. Grant Award: $458,524. Status: Completed on schedule. Point-of-Contact: Sara Moses (GLIFWC Environmental Biologist). Project Officer: Tina Davis (EPA GLNPO). All quarterly GLAS and semiannual project reports were completed on time.

EPA Lake Superior Protection and Management Program, Grant Number: GL00E06501-01. Project Title: Contaminant Testing of Lake Superior cisco. Project Period: 10/1/2007 – 9/30/2011. Grant Award: $369,500. Status: Completed on schedule, successfully closed and audited. Point-of-Contact: Ann McCammon-Soltis (GLIFWC Director of Intergovernmental Affairs). Project Officer: Linda Silwa (EPA). All project updates and reports were completed on time.

EPA GLRI competitive project Grant, Grant Number: GL00E00535. Project Title: Risk Assessment of Invasive Species to Tribal Resources. Project Period: 9/1/2010 – 2/28/2013. Grant Award: $142,430. Status: Completed on schedule. Point-of-Contact: Miles Falck (GLIFWC Wildlife Biologist). Project Officer: Robert Jackson (BIA). All quarterly GLAS and semiannual project reports were completed on time.

EPA GLRI competitive project grant, Contract Number: **CTF55X00115 (and others).** Title of Project: Ceded Territory Wild Rice Protection and Enhancement. Project Period: 10/1/2010 – 9/30/2015. Grant Award: $992,468. Status: Ongoing and on schedule. Point-of-Contact: Peter David (GLIFWC Wildlife Biologist). Project Officer: Robert Jackson (BIA). All quarterly GLAS updates and quarterly reports to the Grant Officer have been completed on time.

EPA GLRI capacity grant, Grant Number GL00653. Title of Project: Lake Superior Protection and Management Program. Project Period: 8/1/2010 – 7/31/2015. Grant Award: $2,000,000. Status: Ongoing and on schedule. Point-of-Contact: Ann McCammon-Soltis (GLIFWC Director of Intergovernmental Affairs). Project Officer: Tina Davis (EPA GLNPO). All quarterly GLAS updates and quarterly reports to the BIA have been completed on time.

VIII. Quality Assurance Project Plan (QAPP) Information

This project will involve the use of existing environmental data. A Quality Assurance Project Plan (QAPP) will be required for this project.

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